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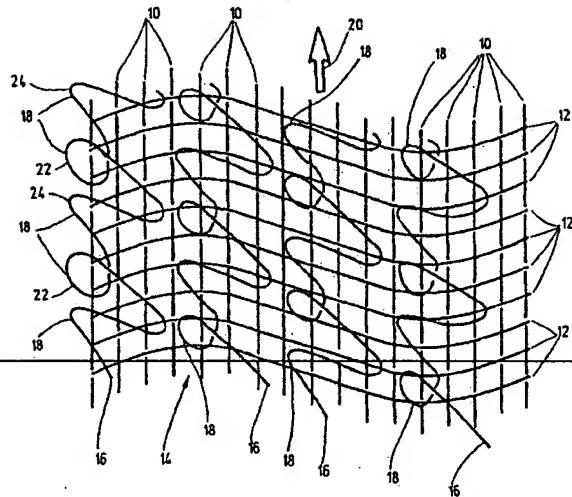
KONSTANTINOS POULAKIS

for

PLANAR ADHESIVE CLOSURE PIECE



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(57) Abstract: The invention relates to a planar adhesive closure piece for an adhesive closure, whereby the corresponding detachable closure elements (18) may be brought into engagement, comprising a base material (14) with warp threads (10) and weft threads (12) and at least one functional thread (16), which partly engages with the base material (14) and which forms the sealing elements (18). A planar adhesive closure piece may be produced more economically, whereby either the warp threads (12) and/or the weft threads (10) are embodied to run with a wave or curve like form. The closure nevertheless has higher adhesive values than closure elements produced with conventional weaving techniques have for the closure elements thereof.

[Fortsetzung auf der nächsten Seite]

Field

of the Invention

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~~Planar Adhesive Closure Piece~~

— The present invention relates to a planar adhesive closure piece for an adhesive fastener in which fastening elements corresponding to each other may be detachably engaged with each other, ~~with a.~~ A base fabric of warp filaments and weft filaments ~~and with has~~ at least one functional filament ~~which extends extending~~ at least partly through the base fabric and ~~which configures providing~~ the fastening elements.

Background of the Invention

Woven adhesive fastener portions may have the warp, weft, and functional filaments of ~~which may consist of~~ textile fibers ~~but also~~and of plastic or metal fibers, and are readily available on the market in a plurality of embodiments. The functional filaments form loop-like hooking elements in the base fabric of warp and weft filaments, if they are made of multifilament threads. If the functional filaments ~~eonsist are~~ of monofilament threads and if the respective closed loops are cut open or separated from each other by thermal means, fastener hooks are obtained which may be engaged with a correspondingly configured fleece loop material of ~~the another~~ fastening element. If in the separating process the free loop ends are subjected to heat treatment, for example, if they are melted open, mushroom-shaped fastener heads are obtained as fastening elements as a result of the inherent behavior of the plastic material. The possibility also exists of

engaging hook-shaped or mushroom-shaped fastener portions with felt-like adhesive fastening elements so that the two elements may be separated.

Very good peeling resistance values can be achieved with the disclosed adhesive fastener systems, that is, relatively high forces are required ~~in order~~ to pull apart the corresponding planar adhesive fastener portions forming the adhesive fastener to discontinue or disengage the connection. However, since the fastening elements of the corresponding fastener portions assume a specific orientation relative to each other, an orientation which is regular from the statistical viewpoint, it has been found in practical applications that after an initial adherence threshold has been crossed the fastener may be easily disengaged, ~~since in~~. In the respective common orientation, the fastening elements adhering to each other readily slide apart and break the connection.

In order to To counter this US problem U.S. Patent No. 5,040,275 proposed, for a cast adhesive fastener portion, that the fastening elements be configured in sinusoidal paths; each. Each fastening element ~~consisting of~~ has a U-shaped hooked pair provided at its free ends with a mushroom head. In addition, spacing is maintained transversely to the sinusoidal path between the U-shaped fastening elements positioned transversely thereto so that the fastener heads may withdraw into the respective clear space ~~so that a~~. A suitably configured fastening element may then be received and engaged as free of resistance as possible in formation of the adhesive fastener, for example, also one in the form of a mushroom-shaped hook configuration. As a result of the sinusoidal path in ~~question in the instance of~~ the cast fastener, in which the U-shaped hook elements are cast in a base-matrix material, the rapid slipping off during opening of the fastener in a direction of stripping is prevented, ~~since the~~. The respective sine wave forces force yielding of the corresponding fastener hook introduced, ~~something which and~~ results in an obstruction, and accordingly, in an increase in the peeling resistance values. In an improved configuration of this solution (U.S. Patent No. 6,076,238) provision has additionally been made

~~such that~~), the hooking pattern with the fastening elements may be configured ~~A~~“chaotically@” in predetermined model patterns, that is, such that the fastening elements are arranged on the base fabric as randomly as possible, ~~in order thus~~ to achieve an effect comparable to that obtained with the sinusoidal configuration. However, the respective cast plastic fastener cannot be produced as fabric with warp and weft filaments ~~and~~. Also, production of this disclosed fastener is complex and cost-intensive.

~~On the basis of this state of the art the~~Summary of the Invention

An object of the present invention is to produce a planar adhesive fastener portion as a woven fastener in a cost-effective manner, ~~where~~ the fastener ~~nevertheless having~~ has higher adherence values for the fastening elements than the fasteners hitherto produced in weaving technology with their fastening elements.

This object is basically attained with a planar adhesive fastener portion having ~~the features specified in claim 1 in its entirety~~.

~~In that, as specified in the characterizing part of claim 1, either the warp filaments and/or the weft filaments is/are-configured to be wave-shaped or curved, the.~~ The linear orientation on the fastening elements of the adhesive fastener previously extending in one direction is avoided~~and the.~~ The curved configuration presents a clearly defined resistance to the disengagement movement of the corresponding fastening elements, so that the retaining forces are essentially constant and thus may also be calculated~~, while the.~~ The peeling resistance values are distinctly increased in relation to the disclosed solutions, ~~which are made up of fabrics with warp and weft filaments.~~ By preferencePreferably, the respective part of the curve or wave is configured as a sinusoidal or cosinusoidal wave.

In an especially preferred embodiment of the adhesive fastener portion ~~claimed for the of the present invention, the weft filaments exclusively~~ are configured to extend in the form of bights in the base fabric, ~~the~~. The respective weft filament ~~extending in~~ extends in an alternating sequence above a warp filament and below the warp filament immediately following. Reliable fastening of the weft filaments in the basic fabric structure is thereby achieved, while the warp filaments, which extend in a linear direction, suitably support the weft filaments in the base fabric.

In another especially preferred embodiment of the adhesive fastener portion ~~claimed for the of the present invention, the respective functional filament extends at least in part between two adjacent warp filaments in the base fabric, extending below every fourth weft filament and over the other weft filaments. By preference provision is also made such that~~ Preferably, in place of the extension below the base fabric of the functional filaments, a loop is formed above the base fabric ~~and such that another~~. Another loop is formed immediately after it.

The respective loops may serve as fleece material for engaging other hooking elements; ~~but they~~. They may also form the fastener hooks after being cut open or thermally separated. ~~By preference~~ Preferably, the functional filament ~~eonsists of~~ is a monofilament ~~which is~~ suitably resistant to the detaching forces and ~~provides~~ providing the engagement and disengagement forces for the adhesive strip fastener it is desired to produce.

~~Other advantageous embodiments are specified in the subsidiary claims.~~

~~The adhesive fastener portion claimed for the objects, advantages and salient features of the present invention is described in greater detail below with the aid of an exemplary will become apparent from the following detailed description, which, taken in conjunction with the~~

annexed drawings, discloses a preferred embodiment illustrated in the drawing, in which of the present invention.

Brief Description of the Drawings

Referring to the drawings which form a part of this disclosure:

FIG. 1 shows a top plan view of the a fabric of the a planar adhesive fastener portion claimed for according to an embodiment of the invention; and

FIG. 2 —— shows a side elevational view of the planar adhesive fastener portion shown in FIG. 1.

Detailed Description of the Invention

FIG. 1 shows a top plan view of a section of the a planar adhesive fastener portion according to an embodiment of the present invention. The adhesive fastener portion claimed for the invention. The adhesive fastener portion in question may be extended as desired in the plane of the drawing in one or the other direction of the illustration, while the. The geometric dimensions of the planar formation depend on the values assigned to the weaving mechanism in which the adhesive fastener portion is produced. The adhesive fastener portion consists of has warp filaments 10 and weft filaments 12 which are interwoven in a transverse configuration to form the base fabric 14 for the adhesive fastener portion. The base fabric 14 is also configured with functional filaments 16 as pile threads. The respective functional filament filaments 16 then forms-form the individual fastening elements 18 for the planar adhesive fastener portion.

It is also to be seen in the line of sight to FIG. 1 on its upper side that, as shown in FIG. 1, an arrow 20 indicates the direction of production of the adhesive fastener portion. In the configuration shown in FIG. 1, the respective weft filaments 12 are configured to be curved as a

sine or cosine wave ~~and at~~. At the intersections of warp filaments 10 and weft filaments 12, the warp filaments 10 extend in parallel with the direction of production 20 and in parallel with each other in a rectilinear arrangement. In the instance of embodiments not shown of the adhesive fastener portion, it would also be possible to arrange the warp filaments 10 additionally or alternatively in a curved configuration. ~~In order for~~ For the weft filaments 12 to follow a curved path as shown in FIG. 1, the producing loom (not shown) provided for ~~the~~ this purpose has a suitably curved reed insert in the form of the sine or cosine wave required. Consequently, the adhesive fastener ~~claimed for the~~ of the present invention may be made available in large quantities at a high production speed ~~and the~~. The sinusoidal or cosinusoidal reed (not shown) engages the respective base fabric 14 transversely to the direction of production 20 to produce the curved weft filament pattern.

In the embodiment shown in FIG. 1, ~~however~~, only the weft filaments 12 are arranged so as to extend in a curved pattern in the base fabric 14, ~~the~~. The respective warp filament 12 alternately ~~extending~~ extends in sequence above a warp filament 10 and below the next one immediately following. The respective functional filaments 16 extend at least partly between two adjacent warp filaments 10 in the base fabric 14; ~~in~~. In the configuration shown in FIG. 1, they extend in sequence below every fourth weft filament 12 and above the other weft filaments 12. In place of the respective extension under the base fabric 14 the functional filament 16 forms a superposed loop 22, ~~another~~. Another loop 24 ~~being~~ is formed immediately after it, ~~so that~~. In this manner, a sort of V-shaped weave is produced. However, other weave forms are also conceivable, such as tying the functional element 16 in the form of a W or the like.

The loops 22, 24 ~~in question~~ form the fastening elements 18 ~~and if~~. If the loops 22, 24 remain closed as illustrated, a sort of fleece adhesive fastener portion is obtained, ~~it being~~ possible for ~~hook~~. Hook-shaped or mushroom-shaped fastening elements ~~to can~~ engage the respective loops 22, 24 ~~in order~~ to obtain a detachable adhesive fastener. The possibility also

exists, however, of cutting the loops 22, 24 open to produce a fastener hook which may engage corresponding nonwoven or fleece material of another fastening element (not shown). If the separation or cutting process is carried out by thermal means, and if the free loop ends in particular are additionally heated, the ends shrink to form mushroom-shaped fastener hooks, so that the fastener hooks may also be mushroom-shaped (not shown). It accordingly is also possible to produce combined fasteners, that is, ones with hook-shaped and loop-shaped elements on a common base fabric 14.

As is shown by FIG. 2 in particular, an individual weft filament 12 may ~~also consist of be~~ a pair of weft filaments or be in the form of multiple filaments. This ~~appliesform could also apply~~ to the warp filaments 10 as well, which warp filaments are shown by the cross-sectional view in FIG. 2 to extend alternately above a pair of weft filaments 12 and then below this weft filament pair 12. The respective functional or pile thread 16 misses one weft filament pair 12 and then extends over the two following weft filament pairs 12 in the sequence shown.

As is also to be seen in the two illustrations, the other loop 24, in order to extend below the base fabric 14, extends below a weft filament 12, ~~which, as~~ As viewed in the line of sight to FIG. 1, a loop 24 is displaced by two warp filaments 10 and two weft filaments 12 laterally from the point at which the preceding loop 22 is positioned on the base fabric 14. Consequently, the loops of the first type 22 and of the other type 24 are positioned on the base fabric 14 so as to be offset from each other, ~~the~~. The loops of the first type 22 forming essentially closed O-shaped loops, while the loops of the other type 24 are configured to be V-shaped or U-shaped. A so-called repeat is effected for a functional filament 16 in the direction of the weft filaments 12 after five warp filaments 10. In addition, the filament systems may ~~consist-be formed~~ of textile fibers, ~~but by preference-~~ Preferably, they are made of a plastic material, nylon or polypropylene in particular. The possibility also exists of using metal fiber systems at least in part for the fastener as illustrated claimed for the of the present invention.

The wave-shaped configuration of the weft filaments 12 makes it possible to obtain increased resistance in the direction of peeling during such peeling, ~~and accordingly.~~ Accordingly, in release of the fastener by ~~way of~~ the correspondingly offset configuration of the loops 22, 24 also configured as hook material, ~~something which the configuration~~ favors the fastening force behavior and thus results in high fastening and peeling strength values for the fastener.

In addition, it is possible to set the adherence values for the fastener to be as constant as possible, as a function of the configuration of the fastener selected, ~~so that the.~~ The adhesive fastener may then always be detached by application of the same detaching force.

Claims

While one embodiment has been chosen to illustrate the invention, it will be understood by those skilled in the art that various changes and modifications can be made therein without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

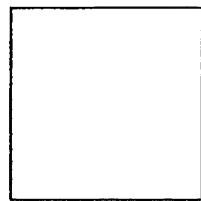
PLANAR ADHESIVE CLOSURE PIECEAbstract of the Disclosure

1. A planar adhesive closure piece for an adhesive fastener in which fastening closure, has detachable closure elements (18) corresponding to each other that may be detachably engaged with each other, having a brought into engagement. A base fabric material (14) of has warp filaments threads (10) and weft filaments threads (12) and having at least one functional filament thread (16) which extends in part through, which partly engages with the base fabric material (14) and which forms the fastening detachable closure elements (18), characterized in that either the weft filaments). A planar adhesive closure piece may be produced more economically. Either the warp threads (12) and/or the warp filaments weft threads (10) are configured embodied to be run with a wave-shaped or curved.
2. The adhesive fastener portion as claimed in claim 1, wherein the respective part of the curve or the wave is configured as a sinusoidal or cosinusoidal wave.
3. The adhesive fastener portion as claimed in claim 1 or 2, wherein exclusively the weft filaments (12) are configured to extend in wave-shaped or curved like form and wherein the respective weft filament (12) alternately extends above a warp filament (10) and below such warp filament (10) immediately following in succession.
4. The adhesive fastener portion as claimed in claim 1 or 3, wherein the respective functional filament (16) extends at least in part between two adjacent warp filaments (10) in the base fabric (14) and wherein such functional filament (16) extends below every fourth weft filament (12) and above the other weft filaments (12).

5. The adhesive fastener portion as claimed in claim 4, wherein, at the point of extension below the base fabric (14), the functional filament (16) forms a superposed loop (22) and wherein another loop (24) is formed immediately following it.
6. The adhesive fastener portion as claimed in claim 5, wherein the other loop (24) extends, for the purpose of extension below the base fabric (14), below a weft filament (12) which is displaced two warp filaments (10) and two weft filaments (12) laterally from the point at which the preceding loop (22) has its position on the base fabric (14).
7. The adhesive fastener portion as claimed in claim 6, wherein the repeat for a functional filament (16) is repeated in the direction of the weft filaments (12) after five warp filaments (10).
8. The adhesive fastener portion as claimed in one of claims 1 to 7, wherein the respective functional filament (16) cut open at the point of formation of a loop (22, 24) forms a fastener hook or wherein, in the event of introduction of thermal energy, on the assumption that the functional filament (16) consists of a plastic material, the separated ends of the fastening elements (18) form mushroom-shaped fastener heads.
9. The adhesive fastener portion as claimed in claim 8, wherein the loops of the first type (22) and of the other type (24) are positioned on the base fabric (14) offset from each other and wherein the loops of the first type (22) are configured essentially as closed ring loops and the loops of the other type (24) are configured to be V-shaped or U-shaped.

10. ~~The adhesive fastener portion as claimed in one of claims 1 to 9, wherein a weft filament (12) or a warp filament (10) or a functional filament (16) consists of a filament system having a plurality of filaments.~~

11. ~~The adhesive fastener portion as claimed in one of claims 1 to 10, wherein the weft filaments (12), the warp filaments (10), and the functional filaments (16) are of a nylon or polypropylene material.~~



The closure nevertheless has higher adhesive values than closure elements produced with conventional weaving techniques have for closure elements.